South Dakota
Department of Game, Fish and Parks

An Educator's Curriculum and Resource Guide for

The South Dakota Breeding Bird Atlas 2

Guide created by Jennifer A. Fowler
SD GF&P Wildlife Diversity Small Grant Project, 2010

SDBBA2 published by Rocky Mountain Bird Observatory
projected 2013?

*** This is a work in progress until the SDBBA2 Atlas document is published ***

SDBBA2: Table of Contents

SDBBA2 : Preface

Welcome to the Educator's Curriculum and Resource Guide for *The South Dakota Breeding Bird Atlas 2.* This supplement can be utilized by the classroom teacher to increase awareness of breeding birds and their distribution within South Dakota. It is a quality product that is ready to use in the classroom to meet selected secondary science standards. The materials can easily be adapted for any K-12 lessons.

This guide is a Microsoft Word document and has been designed for photographs to be copied and pasted into worksheets and PowerPoint presentations for various classroom activities. Permission has been granted for each of the photos in this resource guide and may be used for educational purposes in the classroom provided credit is noted to the photographer.

The activities provided are not detailed, instead they include a list of ideas to choose from to make planning easier and allows for individuality. Active hotlinks are provided to websites with search words for each link should it become inactive. Species accounts in this guide are current as of December 2010. Understand that species information and an agency's management regulations may change over time.

Enjoy traveling throughout South Dakota as you join your students on their avian adventure. These virtual field trips will lead you to various habitats of our state.

~ Jennifer A. Fowler, Science Teacher at South Middle School in Rapid City, SD

***SD Breeding Bird Atlas* books and information obtained by contacting:**
http://www.rmbo.org/SDBBA2

Start with the following links containing information and activities regarding South Dakota's breeding birds:

SD Game, Fish & Parks Wildlife Diversity Program
http://www.sdgfp.info/Wildlife/Diversity/index.htm

US Fish and Wildlife Service: Mountain-Prairie Region
www.fws.gov/mountain-prairie

US Geological Survey Northern Prairie Wildlife Research Center
www.nprwc.usgs.gov

National Park Service: Nature and Science
www.nature.nps.gov/biology

SD Game, Fish & Parks: Endangered Species Act Article
http://www.sdgfp.info/Wildlife/Diversity/Digest%20Articles/ESA.htm

South Dakota Project WILD
www.sdgfp.info/wildlife/education/projwild/projwild.htm

SDBBA2: Final Project Ideas and Works in Progress

1. This site is from NYDEC with a great activity idea for using maps for habitat comparisons. http://www.dec.ny.gov/education/36605.html

2. Add links to natural history info in the Atlas.

3. Add links to completed maps in the Atlas.

4. Create usable data tables and species/habitat index

5. Design an activity for comparing the SDBBA1 and SDBBA2.

6. Complete activities for 9-12.E.1.2, 9-12.L.1.2A, 9-12.L.3.1A, and 9-12.L.2.2

7. Create a glossary that correlates with terms used in the SDBBA2 publication.

8. Revise the text boxes for the Habitat photos as well as the Missouri River photos to meet the needs of the Atlas.

9. Narrow down the list of bird species in the classification table. This needs to be done after the atlas publication to ensure influential species are present to compare and contrast with others. (The large list of species currently in the table are those that are interesting, unique, or have a good story to tell regarding their natural history in SD.)

10. Environmental Education activities need to be matched to each of the activities in this guide.

SDBBA2 : Birding Resources

SD Online Seasonal Bird Observation Report System website

Environmental Education Curriculum Guides:

Contact SD Coordinators for workshop information.

SD Project Learning Tree
SD Project WILD (Aquatic WILD and Flying WILD)
SD Project WET
SD Leopold Education Project

Local Organizations/Resources:

South Dakota Ornithologists' Union This site is the portal for info regarding SD birds! AND the new SD checklist!!!
Sioux Falls Bird Club Attend a meeting, field trip, or have them come visit your classroom!
Northern Hills Bird Club Attend a meeting, field trip, or have them come visit your classroom!
Rocky Mountain Bird Observatory Volunteer to atlas an area near you!
SD Game, Fish and Parks Wildlife Diversity Program Resource for SD's rare and endangered species
SDOU Online Seasonal Bird Observation Report System Database to search and report SD bird sightings

Bird Monitoring Opportunities:

Opportunities:
Great Backyard Bird Count administered by The Cornell Lab of Ornithology and The National Audubon Society
Project Feeder Watch administered by The Cornell Lab of Ornithology
Christmas Bird Counts administered by The National Audubon Society
Breeding Bird Surveys administered by U.S. Geological Survey

SDBBA2: Middle School Science Standards

Using this Resource Guide for *SDBBA2*, portions of the following South Dakota Secondary Science Content Standards, adopted by the SD DOE on March 22, 2005, may be met. A teacher's use of this guide may also accomplish other standards not included in this list.

SD Science Content Standards
http://doe.sd.gov/contentstandards/

6th Grade Science Standards included in this guide:

6.L.1.2. Students are able to explain the importance and scientific use of a classification system.
- Management of diversity for *organization and categorization*
- *Uniform scientific communication*

Example: identification and classification of newly-discovered organisms
√ Kingdom, phylum, class, order, family, genus, species
√ Kingdom classification system (monera, protista, plantae, fungi, animalia)

6.S.1.1. Students are able to describe how science and technology have *helped society to solve problems*.
Examples: *GPS*, *GIS*, *remote sensing*, prevention and treatment of diseases, vaccinations, water treatment, prosthetics

6.S.2.1. Students are able, given a scenario, to identify *the problem(s) of human activity* on the local, regional, or global environment. Examples: *urban expansion*, water treatment

7th Grade Science Standards included in this guide:

7.L.1.3. Students are able to *classify organisms* by using the currently recognized kingdoms. (Application)
Examples: monera, protista, plantae, fungi, animalia
√ Identify and compare the *basic structure and function of major taxa*.
√ Describe the *levels of organization* within organisms.
Example: cells to tissues to organs to systems to organisms

7.L.3.1. Students are able to predict the *effects of biotic and abiotic factors on a species' survival*. (Application)
Examples: adaptations, genetic defects, *population disturbances*, over-reproduction, animal behavior, *flooding*, global warming, oil spills, *human activity*
√ Describe processes by which matter and energy flow through an ecosystem.
Examples: photosynthesis, respiration, nitrogen cycle
√ Use geospatial technologies to investigate natural phenomena.
Examples: *GPS*, *GIS*, *remote sensing*

7.S.1.1. Students are able to describe how *science and technology are used to solve problems* in different professions and businesses. (Comprehension)
Examples: *GPS*, *GIS*, *remote sensing*, agriculture and genetics, medical and bio-technology (EKG), food industry and chemistry

7.S.2.1. Students are able, given a scenario, to *predict the consequence(s) of human activity* on the local, regional, or global environment. (Application)
Example: *Missouri River dams* and water needs

SDBBA2: High School Science Standards

High School Life Science Standards included in this guide:

9-12.L.1.2 Students are able to classify organisms using characteristics and evolutionary relationship of major taxa.

9-12.L.1.2A Students are able to describe how living systems use biofeedback mechanisms to maintain homeostasis.

9-12.L.1.3 Students are able to identify structures and functional relationships within major taxa.

9-12.L.1.5A Students are able to classify organisms using characteristics and evolutionary relationships and domains.

9-12.L.2.2 Students are able to describe how genetic recombination, mutations, and natural selection lead to adaptations, evolution, extinction, or the emergence of new species.

9-12.L.3.1 Students are able to identify factors that can cause changes in stability of populations, communities, and ecosystems.

9-12.L.3.1A Students are able to relate genetic, instinct, and behavior patterns to biodiversity and survival of species.

High School Earth Science Standards included in this guide:

9-12.E.1.1A Students are able to explain how elements and compounds cycle between living and non-living systems.

9-12.E.1.2 Students are able to describe how atmospheric chemistry may affect global climate.

9-12.E.1.3 Students are able to assess how human activity has changed the land, ocean, and atmosphere of Earth.

High School Science and Society Standards included in this guide:

9-12.S.1.1 Students are able to explain ethical roles and responsibilities of scientists and scientific research.

9-12.S.1.2 Students are able to evaluate and describe the impact of scientific discoveries on historical events and social, economic, and ethical issues.

9-12.S.2.1 Students are able to describe immediate and long-term consequences of potential solutions for technological issues.

SDBBA2: Activities ~ Atlas Scavenger Hunt

OBJECTIVES Students will become familiar with the layout and contents of the SDBBA2.

MATERIALS Atlas book and website

ACTIVITY IDEAS

1. Student groups compete for accuracy while locating the following items in the Atlas book and/or on the website:

    a. Table of Contents
    b. Map of South Dakota
    c. List of breeding birds found in South Dakota
    d. Description of codes used in the Atlas
    e. Description of habitats in South Dakota

2. Students could record some information found in each of the items of the atlas. For example, middle school students could write three pieces of information from each part of the atlas listed in #1.

*** Note: This activity will be completed in its entirety upon publication of the atlas book/website.

SDBBA2: Activites ~ Interview with an Atlas Volunteer

*** Note: Work in progress and need to include info from handbook

STANDARDS All ages and 9-12.S.1.1

OBJECTIVES Students and educators will gain background information on atlasing.

ACTIVITY IDEAS Students and educators could read through the following information individually or as a group.

What is a breeding bird atlas? ……

The first SD breeding bird atlas: 1988 – 1993
The second SD breeding bird atlas: 2008 – 2012

Goals and objectives of the Breeding Bird Atlas:……

What is an atlas block?

There are ____ total blocks each measuring 3 mile x 3 mile.

Where in South Dakota are the blocks?

Find the map at www.rmbo.org/sdbba2

How is atlas block data collected?

1. Atlas blocks are surveyed by volunteers and some paid technicians.

2. The surveyor uses maps to locate their atlas block, then determine who owns the land- public or private. Permission is needed before walking on private lands.

3. Since the goal is to document all the breeding birds in a block, all the different habitats must be visited. Some birds can be found in multiple habitats, but some have specific needs.

4. After reading the handbook, copying data forms, and speaking to landowners, we are ready to travel to the block.

What do you take with you into the field?

Binoculars, bird field guides, field data forms, clipboard, spotting scope, hat, comfortable hiking shoes, pants, t-shirt, hiking stick, cell phone for emergencies, water, snacks, GPS unit…

What hints would you give to other atlasers heading out into the field?

Know what species of birds to expect in the habitat you are visiting. Look and listen! Visit early in the day, between sunrise and 9am are the best times to hear birds singing. Even if you hear a bird, try to confirm it. Singing does not mean it has a nest or a mate.

Why is it suggested that you carry a GPS unit?

We carry a GPS unit to mark the locations we collect data and so that area can be visited again in the future. The coordinates also allow the location to be marked on a map using GIS software to make the maps in the Atlas. (see activity focusing on this topic)

Any advice to other atlasers or others when birding?

We have an ethical and responsible duty when conducting scientific research. It is important to be honest when collecting data since it would be dishonest to make up numbers. We should all be respectful towards the landowners because we need their partnership to ensure we can return to their property in the future. Being respectful to the birds and their habitat is equally important. We don't want to disturb the birds' breeding activities and we should minimize our impact on the habitat we are studying.

*** Note: This activity will be completed in its entirety upon publication of the atlas book/website.

SDBBA2 : Activities ~ The Anatomy of an Atlas

OBJECTIVES	Students will learn the meaning of the scientific information in the Atlas such as breeding status, behavior, and habitat codes
ACTIVITY IDEA	Make a card game like Memory matching the codes with their definitions

Descriptions for O PO PR and CO
Habitat examples, look at habitat photos for visuals of selected habitats listed below.

1. Upland shelter belt
2. Lowland forest, riparian and/or woody draw
3. Shrubland: upland and lowland
4. Grassland: upland and lowland
5. Wetland
6. Open water
7. Cropland
8. Special
    a. Burned
    b. Prairie dog town
    c. Scattered single trees
    d. Badlands and mudflats
9. Human environment
10. Other

Block Identification Codes:

1 R = 1st atlas random block
2 R = 2nd atlas random block
2S = 2nd atlas special block

*** When finished, this activity will have explanations for terms in the atlas like map symbols, breeding confirmation levels, habitat categories, and any other symbols and abbreviations used in the Atlas.

*** Note: This activity will be completed in its entirety upon publication of the atlas book/website.

SDBBA2: Activities ~ Beginning Activity

SD SCIENCE STANDARDS Important for all levels to begin learning about the SD Breeding Bird Atlas.

OBJECTIVES Students will become familiar with birds breeding near their homes by studying nearby atlas blocks, habitats, and the birds within them.

MATERIALS

ACTIVITY IDEAS

1. Students pick an atlas block near where they live.
2. Determine what species breed there, either from maps, or online species list for each block.
3. Choose one or more species of bird to learn about and share their information (give websites used)
4. Students determine the habitats present in their block using information from the atlas
5. Student study the block's habitat to determine areas of good vegetation that should be protected. Is it a wetland? A shelterbelt?
6. Students determine if there are any special habitat areas that should be protected for the future.
7. What can be done to ensure the current breeding birds return each year to "your" block?

*** Note: This activity will be completed in its entirety upon publication of the atlas book/website.

*** Maybe make up a worksheet for students to fill in with information regarding their chosen block. County, block ID, habitats, common birds, unique birds, other info, center coordinates, urban or rural setting, road access, etc.

SDBBA2: Activities ~ The Basics of GPS/GIS/Remote Sensing

SD SCIENCE STANDARDS 6.S.1.1, 7.S.1.1, 7.L.3.1

OBJECTIVES Students will study how science and technology can be used to solve problems.

MATERIALS Websites listed on this page

ACTIVITY IDEAS

1. Students utilize the listed websites to investigate the current research conducted in South Dakota utilizing GPS, GIS, and remote sensing.
2. Students determine how this technology can assist in the study and management of the breeding bird species in South Dakota.
3. What are some professions that use GIS and GPS?
4. How can this technology solve problems?

Global Positioning Systems
http://www.gps.gov/

South Dakota GAP Analysis Project (with habitat requirements for all vertebrates)
http://www.sdstate.edu/wfs/gap/index.cfm

SD Land Cover Classification by South Dakota GAP Analysis Project
http://www.sdstate.edu/wfs/gap/coverclass/index.cfm

USGS Earth Resources Observation and Science (EROS)
http://eros.usgs.gov/

USGS South Dakota Land Cover Images
http://landcover.usgs.gov/southdakota.php

??? Are there any RMBO sites for info or maps showing use of GPS/GIS/remote sensing???

*** Note: This activity will be completed in its entirety upon publication of the atlas book/website.

SDBBA2 : Activities ~ The Making of the Maps

SD SCIENCE STANDARDS 6.S.1.1, 7.S.1.1, 7.L.3.1

OBJECTIVES Students will study how science and technology were used to make the maps found in the SDBBA2

MATERIALS

ACTIVITY IDEAS

How do biologists use GIS, GPS and Remote Sensing to make the maps in the Atlas?

GPS = used to collect the latitude and longitude coordinates
GIS = software that the GPS data is put into
Maps made in GIS have layers that can be shown depending on the purpose of the particular map.

How is field data translated to maps? (location and abundance)

*** Gather info and ideas from RMBO staff completing this portion of the atlas
*** Note: This activity will be completed in its entirety upon publication of the atlas book/website.

SDBBA2: Activities: South Dakota's Threatened and Endangered Birds

*** Note: This activity will be completed in its entirety upon publication of the atlas book/website.

*** Activity ideas include determining if the following eight T and E species are all breeders in SD, and which part of the state are they found in? What are their habitat requirements? What is a main cause for each of them to be listed as threatened or endangered? If they are not breeders in SD, then why would we 'list' them in SD? Research the differences between naming a bird as T or E. Determine why some species are listed in SD but not federally.

Common Name	**Scientific Name**	**Status**
Peregrine Falcon	*Falco peregrinus*	SE
Whooping Crane	*Grus americana*	FE, SE
Bald Eagle	*Haliaeetus leucocephalus*	*FT*, ST
Eskimo Curlew	*Numenius borealis*	FE, SE
Interior Least Tern	*Sterna antillarum athalassos*	FE, SE
Piping Plover	*Charadrius melodus*	FT, ST
Osprey	*Pandion haliaetus*	ST
American Dipper	*Cinclus mexicanus*	ST

SE = state endangered (in S.D.) ST = state threatened (in S.D.)
FE = federal endangered FT = federal threatened CL = candidate for federal listing
ST and FT in Italics = species delisted since *Fragile Legacy* publication in 2006

SDBBA2: Activities ~ Breeding Bird Classification

SD SCIENCE STANDARDS 6.L.1.2, 7.L.1.3, 9-12.L.1.2, 9-12.L.1.3, 9-12.L.1.5A

OBJECTIVES Students will study the scientific classification, organization, and categorization of selected breeding birds found in South Dakota. Students will practice classifying organisms based on their traits of structure and function.

MATERIALS Scientific Classification Table
Animal Photo Card pages

ACTIVITY IDEAS

1. Students locate trends in the classification table then compare and contrast their findings. (Examples: all birds are in the same Kingdom, Phylum, and Class. Some birds all names except a species name, and each bird has a unique scientific name)
2. Teacher could print, laminate and cut the 18 photo cards, making 1 set for each group of students. (paperclip together and store in envelope) Students make a dichotomous key by separating the 18 cards into categories based on physical traits found in the photos.
3. Students compare their criteria for splitting the first few categories of the photo cards with results from other student groups. Were some easier to split that others? What features did you most often use?
4. Looking at the photo cards, can birds' habitat and behavior be hypothesized buy its traits? Check the natural history portion of the SDBBA2 for more info. (Example: Great Blue Heron in wetlands with long legs.)

SDBBA2: Activities ~ Natural Influences on Habitat and Birds

SD SCIENCE STANDARDS 7.L.3.1 (check for others)

OBJECTIVES Students will study the effects of natural biotic and abiotic factors on habitat and birds' survival.

MATERIALS

ACTIVITY IDEAS

1. Research how prairie bird species are adapted to survive and recover from the following natural occurrences: fire, floods, drought, and grazing pressure.

There is a natural wet and dry climate cycle in South Dakota's Great Plains. Determine how wetland birds adapt to this cycle. How do grassland birds adapt? (West River stock dams are important to waterfowl during East River droughts)

*** Note: This activity will be completed in its entirety upon publication of the atlas book/website. More research is needs and sources of information are needed.

SDBBA2: Activities ~ Human Activity Influences on Habitat and Birds

SD SCIENCE STANDARDS 6.S.2.1, 7.S.2.1, 7.L.3.1, 9-12.E.1.3, 9-12.S.1.2, 9-12.E.1.1A, 9-12.L.3.1, and 9-12.S.2.1

OBJECTIVES Students will study the effects of human activity on habitat and birds' survival. Students will identify ways humans have managed lands for habitat preservation.

MATERIALS

ACTIVITY IDEAS

1. Students make a t-chart to list the negative factors of human influence and the possible solutions for each. (Project WILD activities regarding disease, habitat change or decrease, and over harvesting.)

   Negative Human Activities:
   a. Urban Expansion = development decreases habitat for breeding birds. (See the Urban Expansion activity)
   b. Pollution causes bioaccumulation in living things. Food sources such as aquatic insects could be destroyed.
   c. Poaching
   d. Land is changed from rangeland to croplands.

2. Students research more details regarding the positive human influences on the land and bird populations. These activities could maintain breeding populations.

   Positive Human Activities:
   a. Scientists and land managers = NWR, GPA, WPA
   b. Land Owners = manage grasslands and wetlands with wildlife and habitat in mind. Many participate in the Conservation Reserve Program (CRP)

*** Compare SDBBA1 to SDBBA2
*** npwrc.usgs.gov/resource/birds/glbuse2/….htm
*** Note: This activity will be completed in its entirety upon publication of the atlas book/website. More research is needs and sources of information are needed.

SDBBA2: Activities ~ Urban Expansion Virtual Field Trip

SD SCIENCE STANDARDS 6.S.2.1, 7.S.2.1 (other standards?)

OBJECTIVES Students will identify that habitat loss due to human activity is a major problem for birds' breeding success.

MATERIALS Habitat Photos

ACTIVITY IDEAS

1. Students first define urban expansion and identify some reasons for it.
2. Students identify ways urban expansion affects habitat for birds.
3. Teacher could print habitat photos or project in a larger format so students could discuss what they notice in each of the photos.
4. Students draw human impacts on printed pictures. (houses, cattle, towns, septic, roads)
5. Students notice the erosion patterns in the watershed as seen in the habitat photos. If the area were to be polluted by hazardous liquids, where would it move to? What factors are influenced by the watershed?
6. Students predict how future urban expansion may affect species that are not currently ranked as threatened or endangered in SD.
7. Students identify methods of conscientious urban development to minimize the human impact on the environment such as urban planning.
8. *** Compare and contrast species of birds in an urban block and a rural block. Which species in the rural block would disappear if the area were to be influenced by urban expansion?

*** Note: This activity will be completed in its entirety upon publication of the atlas book/website.

SDBBA2: Activities ~ Missouri River Habitat Investigation

SD SCIENCE STANDARDS 6.S.2.1, 7.L.3.1, 7.S.2.1, 9-12.L.3.1, 9-12.E.1.3, 9-12.S.1.2, 9-12.S.2.1

OBJECTIVES Students will study the effects that Missouri River dams could have on breeding birds in South Dakota. Students will also determine effects of human activity, flooding, and other abiotic factors on animal species.

MATERIALS Missouri River Photos

ACTIVITY IDEAS

1. Students use the Least Tern and Piping Plover habitat photos to discuss requirements for their nesting habitat. What human actions could insure continual habitat availability?
2. Students study the invasive species sign and discuss the detriment of those species to the native ones in the Missouri River.
3. Students use the Gavin's Point photo to discuss advantages and disadvantages of dams in the Missouri River in regards to breeding birds.
4. Students use the Endangered Species Habitat sign to discuss the role of educating the public regarding threatened and endangered species found in the area.
5. Students discuss what their role could be in conserving Missouri River habitat for future generations.
6. Students discover more information regarding the Missouri River on the following website:

   US Army Corps of Engineers: Missouri River Basin
   http://www.nwd-mr.usace.army.mil/rcc/

*** Put the following into the form of questions on the photos. Flooding: what is the effect on birds? Increased shoreline is good but nests can be washed out but can rebuild if time in the season. Dams releasing: flood creeks, rivers but create more back water wetland areas. What can be done to decrease loss so that birds continue to choose to breed in that location and be successful? = dams release gradually and not during nesting season. Also plant vegetation as restorative project to prevent damage from flooding.

SDBBA2: Species List and Scientific Classification

SD Breeding Bird Atlas 2 **Species List and Scientific Classification**

This is a list of birds that will be covered in this guide. Similar species will be compared by habitat/ranges, common/rare.
Some species will be identified with range changes between atlases.
Some of these species have specific habitat requirements.
Some species hybridize in SD (eastern sp with similar western sp)
(and gone through name changes as more research conducted.)
**** Species can be added or removed based on atlas 2 completion.**

All birds are in Kingdom Animalia, Phylum Chordata, Class Aves

Common Name	**Order**	**Family**	**Genus**	**species**
Wood Duck	Anseriformes	Anatidae	*Aix*	*sponsa*
Ring-necked Pheasant	Galliformes	Phasianidae	*Phasianus*	*colchicus*
Ruffed Grouse	Galliformes	Phasianidae	*Bonasa*	*umbellus*
Greater Sage-Grouse	Galliformes	Phasianidae	*Centrocercus*	*urophasianus*
Sharp-tailed Grouse	Galliformes	Phasianidae	*Tympanuchus*	*phasianellus*
Greater Prairie-Chicken	Galliformes	Phasianidae	*Tympanuchus*	*cupido*
American White Pelican	Pelecaniformes	Pelecanidae	*Pelecanus*	*erythrorhynchos*
Great Blue Heron	Ciconiiformes	Ardeidae	*Ardea*	*herodias*
Osprey	Falconiformes	Accipitridae	*Pandion*	*haliaetus*
Northern Goshawk	Falconiformes	Accipitridae	*Accipiter*	*gentillis*
Broad-winged Hawk	Falconiformes	Accipitridae	*Buteo*	*platypterus*
Red-tailed Hawk	Falconiformes	Accipitridae	*Buteo*	*jamaicensis*
Virginia Rail	Gruiformes	Rallidae	*Rallus*	*limicola*
Snowy Plover	Charadriiformes	Charadriidae	*Charadrius*	*alexandrinus*
Piping Plover	Charadriiformes	Charadriidae	*Charadrius*	*melodus*
Killdeer	Charadriiformes	Charadriidae	*Charadrius*	*vociferous*
Common Tern	Charadriiformes	Laridae	*Sterna*	*hirundo*
Least Tern	Charadriiformes	Laridae	*Sternula*	*antillarum*
Eurasian Collared-Dove	Columbiformes	Columbidae	*Streptopelia*	*decaocto*
Mourning Dove	Columbiformes	Columbidae	*Zenaida*	*macroura*
Black-billed Cuckoo	Cuculiformes	Cuculidae	*Coccyzus*	*erythropthalmus*
Yellow-billed Cuckoo	Cuculiformes	Cuculidae	*Coccyzus*	*americanus*
Burrowing Owl	Strigiformes	Strigidae	*Athene*	*cunicularia*
Black-backed Woodpecker	Piciformes	Picidae	*Picoides*	*arcticus*
Northern Flicker	Piciformes	Picidae	*Colaptes*	*auratus*
Western Wood-Pewee	Passeriformes	Tyrannidae	*Contopus*	*Sordidulus*
Eastern Wood-Pewee	Passeriformes	Tyrannidae	*Contopus*	*virens*
Western Kingbird	Passeriformes	Tyrannidae	*Tyrannus*	*verticalis*
Eastern Kingbird	Passeriformes	Tyrannidae	*Tyrannus*	*tyrannus*
Gray Jay	Passeriformes	Corvidae	*Perisoreus*	*canadensis*
Blue Jay	Passeriformes	Corvidae	*Cyanocitta*	*cristata*
Black-billed Magpie	Passeriformes	Corvidae	*Pica*	*hudsonia*
Tree Swallow	Passeriformes	Hirundinidae	*Tachycineta*	*bicolor*
Violet-green Swallow	Passeriformes	Hirundinidae	*Tachycineta*	*thalassina*
Red-breasted Nuthatch	Passeriformes	Sittidae	*Sitta*	*canadensis*
White-breasted Nuthatch	Passeriformes	Sittidae	*Sitta*	*carolinensis*
Brown Creeper	Passeriformes	Certhiidae	*Certhia*	*americana*
House Wren	Passeriformes	Troglodytidae	*Troglodytes*	*aedon*
Marsh Wren	Passeriformes	Troglodytidae	*Cistothorus*	*platensis*
American Dipper	Passeriformes	Cinclidae	*Cinclus*	*mexicanus*
Golden-crowned Kinglet	Passeriformes	Regulidae	*Regulus*	*satrapa*
Ruby-crowned Kinglet	Passeriformes	Regulidae	*Regulus*	*calendula*
Eastern Bluebird	Passeriformes	Turdidae	*Sialia*	*sialis*
Mountain Bluebird	Passeriformes	Turdidae	*Sialia*	*currucoides*

Virginia's Warbler	Passeriformes	Parulidae	*Vermivora*	*virginiae*
Spotted Towhee	Passeriformes	Emberizidae	*Pipilo*	*maculatus*
Eastern Towhee	Passeriformes	Emberizidae	*Pipilo*	*erythrophthalmus*
Lark Bunting	Passeriformes	Emberizidae	*Calamospiza*	*melanocorys*
Grasshopper Sparrow	Passeriformes	Emberizidae	*Ammodramus*	*savannarum*
Baird's Sparrow	Passeriformes	Emberizidae	*Ammodramus*	*bairdii*
Lazuli Bunting	Passeriformes	Cardinalidae	*Passerina*	*amoena*
Indigo Bunting	Passeriformes	Cardinalidae	*Passerina*	*cyanea*
LAZB x INBU hybrid	Passeriformes	Cardinalidae	*Passerina*	*amoena x cyanea*
Eastern Meadowlark	Passeriformes	Icteridae	*Sturnella*	*magna*
Western Meadowlark	Passeriformes	Icteridae	*Sturnella*	*neglecta*
Bullock's Oriole	Passeriformes	Icteridae	*Icterus*	*bullockii*
Baltimore Oriole	Passeriformes	Icteridae	*Icterus*	*galbula*
Hybrid – BUOR x BAOR	Passeriformes	Icteridae	*Icterus*	*bullockii x galbula*
Great-tailed Grackle	Passeriformes	Icteridae	*Quiscalus*	*mexicanus*
Common Grackle	Passeriformes	Icteridae	*Quiscalus*	*quiscula*
Lesser Goldfinch	Passeriformes	Fringillidae	*Carduelis*	*psaltria*
American Goldfinch	Passeriformes	Fringillidae	*Carduelis*	*tristis*

Bird photos courtesy of Doug Backlund wildphotosphotography.com

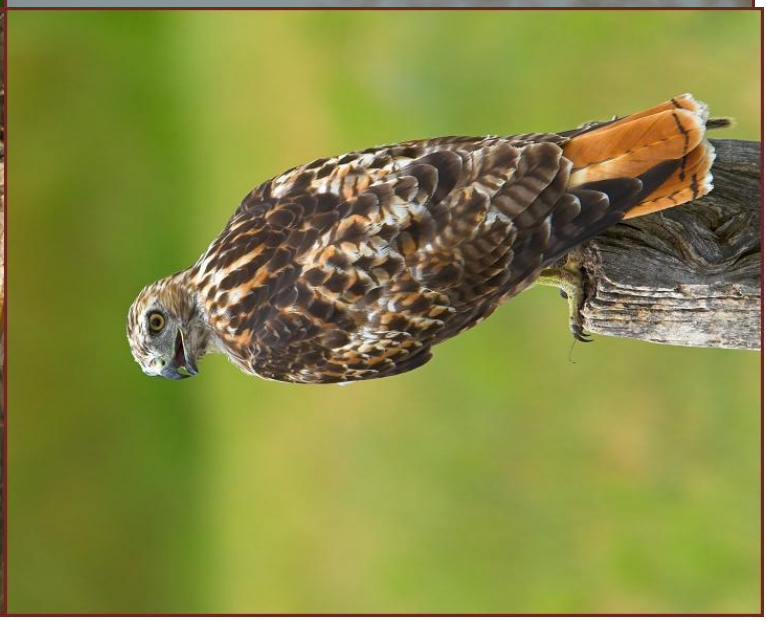
Grasshopper Sparrow
Snowy Plover
Eurasian Collared-Dove
Mourning Dove
Great-tailed Grackle
Red-breasted Nuthatch

Bird photos courtesy of Doug Backlund wildphotosphotography.com

Lazuli Bunting
Ring-necked Pheasant
Killdeer
American Dipper
White-breasted Nuthatch
Spotted Towhee





Bird photos courtesy of Doug Backlund wildphotosphotography.com

Burrowing Owl
Yellow-billed Cuckoo
Great Blue Heron
Indigo Bunting
American White Pelican
Red-tailed Hawk

SDBBA2: Habitats

Grassland – Hayfield

Meade County, SD

Photo courtesy of Jennifer A. Fowler

Grassland- Pasture

Meade County, SD

Photo courtesy of Jennifer A. Fowler

SDBBA2: Habitats

Cropland

Meade County, SD

Photo courtesy of Jennifer A. Fowler

Open Water

Big Sioux River along Hwy 13, north of Flandreau in Moody County, SD.

Photo courtesy of Jennifer A. Fowler

SDBBA2: Habitats

Human Environment

Pennington County, SD

Photo courtesy of Jennifer A. Fowler

Lowland Forest, Woody Draw

Harding County, SD

Photo courtesy of Jennifer A. Fowler

SDBBA2: Habitats

Special – Badlands

Pennington County, SD

Photo courtesy of Jennifer A. Fowler

Wetland

Meade County, SD

Photo courtesy of Jennifer A. Fowler

SDBBA2: Activities ~ Missouri River Photographs

Eastern shore of Lake Oahe, north of Pierre, SD.

Rocky and sandy lake shores are nesting sites for Interior Least Terns and Piping Plovers. Do Not Enter signs are posted in the nesting areas.

Photo courtesy of Jennifer A. Fowler

Rocky island in Lake Oahe north of Pierre, SD.

Islands like these are important nesting sites for Interior Least Terns and Piping Plovers.

Photo courtesy of Ricky D. Olson

SDBBA2: Activities ~ Missouri River Photographs

'Do Not Enter' nesting awareness sign in nesting bird habitat.

Signs like this are posted near Interior Least Tern and Piping Plover nesting sites to deter human disturbances.

Photo courtesy of Carol Aron, USFWS

Invasive species prevention sign along Missouri River.

Eurasian watermilfoil, zebra mussels, and purple loosestrife are invasive species that are prolific in other areas of the United States. Signs like these are aimed to avoid their spread.

Photo courtesy of Jennifer A. Fowler

SDBBA2: Activities ~ Missouri River Photographs

Endangered Species Habitat Area sign posted at a boat launch along the Missouri River.

Educating the public is an effective way of ensuring the success of endangered species.

Photo courtesy of Jennifer A. Fowler

Gavin's Point Dam on the Missouri River, upstream of Yankton, SD.

Photo courtesy of Jennifer A. Fowler